COMPREHENSION OF ONLINE CONSUMER-GENERATED PRODUCT REVIEW: A CONSTRUAL LEVEL PERSPECTIVE

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Abstract

This study explores how consumers, who differ in their psychological distance toward the purchasing event (i.e., temporal distance) or toward product review writers (i.e., social distance), comprehend concrete or abstract reviews. Two experiments were conducted. The first experiment examined how a consumer's perception of temporal distance, near future or distant future, would affect his/her comprehension of product reviews of varying abstractness. Results reveal that consumers of near temporal distance perceive concrete reviews to be more helpful. These consumers express a higher recall ability compared to counterparts of distant temporal distance. However, consumers of near temporal distance perceive abstract reviews to be less helpful and express a lower recall ability compared to those of distant temporal distance. The second experiment investigated how social distance, i.e., whether the review is written by someone who is perceived to be socially close to the reader would influence his/her comprehension of product reviews of varying abstractness. Results indicate that, with the provision of concrete reviews, consumers perceive non-significant difference of the review helpfulness under near and distant social distance and exhibit comparable recall ability. With the provision of abstract reviews, however, consumers of a near social distance recognize the reviews as helpful and recall the product better than did those of a distant social distance. This study presents a theoretically-driven and empirically-validated proposition to improve the presentation of product reviews to aid consumer review comprehension.

Keywords: Consumer review, temporal distance, social distance, construal level, review helpfulness, recall

Introduction

The review helpfulness voting mechanism is an important IT artifact of an online review system. It not only helps consumers to locate the reviews generally perceived to be helpful (Cao et al. 2011; Ghose and Ipeirotis 2007), but also promotes sales. The most vivid example is Amazon.com. As the largest B2C online platform, during 2007—2011, Amazon initially presented the most recent reviews, then the valence, then spotlight reviews, and recently presented reviews with the helpfulness voting. A recent statistical report revealed that the updated feature on the Amazon site brings about $2.7 billion additional revenue (Spool 2009).

A critical factor determining whether the review helpfulness voting mechanism would yield benefits to consumers and firms is the identification of reviews that are truly helpful to the consumers. Our review of the extant literature suggests that several recent works have attempted to identify reviews that are helpful (Forman et al. 2008; Otterbacher 2009; Pan and Zhang 2011; Zhang et al. 2010; Zhang and Tran 2011). These studies have primarily focused on how a reader comprehends a review based on the authorship (e.g., reviewer information) and the content (e.g., subjective or objective) (Forman et al. 2008; Ghose and Ipeirotis 2007). Among these studies, mixed findings are observed. For instance, in the investigation of the relationship between reviewer information and perceived review helpfulness, Forman et al. (2008) find that reviews with disclosed reviewer information are rated as more helpful than reviews by anonymous reviewers. Similar findings found by several other researches (e.g., Bickart 2010; Connors et al. 2011). Some studies (e.g., Chen et al. 2008), however, fail to find a significant relationship between the disclosure of reviewer information and the perceived review helpfulness. A plausible explanation, as proposed by Zhao and Xie (2011), is that closeness of others is not always positively related to the review helpfulness. Instead, the relationship is contingent on the time preference. Moreover, similar mixed findings are also observed in studies investigating the relationship between review objectivity and perceived review helpfulness. For instance, Ghose and Ipeirotis (2007) find that a mixture of objective and highly subjective sentences has a positive effect on product sales, and such type of reviews is perceived more helpful than reviews that are purely objective or subjective. However, Ghose and Ipeirotis (2010) find the opposite results.

Notwithstanding the mixed findings, these prior studies have informed us about the review itself. However, given that it is how a reader comprehends a review that determines the degree of helpfulness of the content, it is imperative that we also consider the relationship between the review and the reader himself. In other words, to understand whether a review is considered to be helpful is not only about "who" says "what" (Ghose and Ipeirotis 2010), but also "who" comprehends "who says what". To this end, there are two key components worthy of investigation: the review itself and the affiliated dynamics.

With respect to the review itself, we conceive that product review could induce different construal levels of the target (i.e., the product) depending on whether the review description is concrete or abstract (Park 2008). Construal level denotes the level of abstraction of information representation. That is, a high construal-level denotes a schematic representation that emphasizes superordinate features (i.e., at an elevated level), while a low construal-level denotes a relatively unstructured representation that denotes the target's subordinate features (i.e., detailed but may not have a gestalt construction of the target). To illustrate, we consider two sets of product review information. High level construal, in our context, refers to the relatively abstract evaluations of a product (e.g., a review might read as: "How beautiful this skirt is. My friend highly recommends it to me."). On the contrary, low level construal refers to a consumer's concrete evaluation of a product, in which the consumer expresses more attribute-related assessment (e.g., a review might read as: "The monitor screen is huge at a 17.3 inch screen size and crystal clear with a screen resolution of 1600x900.").

With respect to the affiliated dynamic of a product review, we draw on the concept of psychological distance. Psychological distance refers to people's subjective distance to an object or event. There are four dimensions of psychological distance, namely, temporal distance, social distance, spatial distance and the hypothetical. In this study, we focus on the temporal distance and social distance because these two dimensions are highly relevant to our online research context and can be manipulated.

Drawing on the construal level theory (Trope and Liberman 2003; Trope and Liberman 2010; Trope et al. 2007), this study focuses on understanding how consumers in different psychological distance (i.e.,

temporal and social distance) comprehend different types of reviews (concrete and abstract) and come up with their evaluations of the review's helpfulness. Using the construal level theory as our theoretical background, this study explores how consumers in different psychological distances comprehend reviews; and whether the reviews of different construal levels can lead to consumers' distinct evaluation of the review helpfulness. This research enriches our current understanding of consumer generated reviews and provides managerial guidance for the practitioners. From a theoretical perspective, this study extends the extant literature by explicitly considering the reader's characteristics, manifested by the psychological distance. From a practical perspective, the results of this study will guide practitioners to improve the current review systems and provide personalized services.

Theoretical Background

Concrete versus Abstract Review Representation

Consumer generated product reviews can be classified as concrete or abstract (Ghose and Ipeirotis 2007; Park and Lee 2008). Concrete reviews commonly talk about product attributes and characteristics related assessments (e.g., "I like this MP4 player as it has 20 GB memory capacity, which is sufficient for me to store more than 100 MP4 files"). In this type of review, a reader can obtain the relatively concrete attribute related information that the reviewer posts. An alternative to such concrete reviews is abstract consumer reviews that express reviewers' own experiences and feelings (e.g., "I really cannot believe I got this. I'm proud of this. For this MP4, I can store so many movie videos"). In this type of review, reviewers leak relatively less concrete attribute related information; they focus on and are more inclined to express their own using and feeling experiences.

Although previous studies reveal that the concrete reviews are more helpful in assisting consumers to make judgments or decisions (Park and Kim 2008; Park and Lee 2008), it has been suggested that abstract reviews may result in more influence on a consumer's judgment or decision. One underlying reason for this effect is that consumers do not always pay attention to concrete product attribute information, but may make their judgment or decision on the basis of experience and feeling oriented information (Petty and Cacioppo 1986; Petty et al. 1980). Another reason is found from prior knowledge literature, from which the results support that concrete reviews are not as helpful as abstract reviews in helping consumer to make judgment or decision because limited product knowledge consumers commonly have difficulty efficiently using the concrete review information (Hong and Sternthal 2010; Maheswaran and Sternthal 1990; Wood and Lynch Jr 2002). Generally, the types of reviews that are more helpful to consumers in making a judgment or decision depend on consumers' information focuses.

We extend previous research by investigating a consumer's psychological distance influence on his/her comprehension of concrete and abstract reviews, and, thus, perception of review helpfulness.

Psychological Distance and Mental Construal

Construal Level Theory (CLT) is an account of how psychological distance influences people's mental construal to an object or event (Liberman and Trope 1998; Liberman and Trope 2008; Trope and Liberman 2003; Trope and Liberman 2010). Psychological distance is defined as people's subjective distance from an object/event in the actor's psychological space (Liberman et al. 2007). People use this concept of psychological distance to describe their feelings about others, objects or events (Fiedler 1953; Liberman et al. 2007). There are four dimensions of psychological distance: the temporal distance, social distance, spatial distance and hypothetical (Liberman et al. 2007). An object or event perceived to be psychologically distant denotes that it is absent from the direct experience of reality, while a psychologically near object or event is direct experience with reality.

An object or event can be represented in different abstract ways, depending on people's psychological distance. Take the temporal distance effect as an example. A notebook computer might be mentally construed as running quickly and looking beautiful (high level construal) by a consumer who plans to buy the product after a year versus a perception of an Intel Core i3 processor showing varnish (low level construal) by the consumer who plans to buy the product tomorrow. One's representation might be

preferentially focused on abstract characteristics (e.g., runs quickly), or concrete characteristics (e.g., Intel Core i3 processor). Construal level theory suggests that the psychological distance of an event or object systematically changes how the event or object is construed (Liberman et al. 2007; Trope and Liberman 2003; Trope et al. 2007). People in psychological proximity construe an object or event with low level mental construal; while in remote psychological distance they construe the object or event with high level mental construal (Smith and Trope 2006; Wakslak et al. 2006). Low level mental construal is defined as people's mental organization of the external object or event with detailed, concrete descriptions; while high level mental construal refers to people's mental organization with relatively abstract, decontextualized descriptions of the product. The theory posits that as people are removed from the direct experience of the object or event, concrete information about them becomes nonexistent. Thus, people have to mentally represent psychologically distant objects by relatively abstract and high level mental construal. On the contrary, when the psychological distance is near, people mentally construe the object with more detailed, contextualized and concrete information as the direct experience of the now, here, and self (Henderson et al. 2006; Liberman and Trope 2008; Trope and Liberman 2010; Trope et al. 2007).

The Effect of Fit from Construal on Review Comprehension

Psychological distance influences a consumer to construe an object or event with different mental construal (high versus low level mental construal). Such mental construal can impact a consumer on processing object related information (Forster et al. 2004; Kim et al. 2008; Lee et al. 2010). The object related information can be characterized by high or low levels of construal. For example, the desirability features of a product (e.g., the quality of the product) can be taken as high level construal, compared with the feasibility of the product (e.g., the price of the product), which can be considered as low level construal of the product (for a review, see Trope and Liberman. 2003; 2010).

Previous research has argued that a fit between the construal level of the externally presented object related information and a consumer's mental construal enhances the perceived value of the information (Fujita et al. 2008; Kim et al. 2008), attitude toward a brand (Higgins et al. 2003; Labroo and Lee 2006; Lee et al. 2010), task performance (Chandra and Krovi 1999; Hong et al. 2004), relevance perception of recommendation (Zhao and Xie 2011), and acceptance of recommendation (Kohler et al. 2011). These outcomes build on the basis of different operationalization of construal level. Kohler et al. (2011) found that concrete (abstract) interactive decision aids are more likely to be accepted by consumers who are in proximal (distant) temporal distance. Fujita et al. (2008) demonstrated that arguments emphasizing primary vs. secondary, desirability vs. feasibility features, and general classes vs. specific cases are more persuasive when the consumers are in distant temporal distance. Lee et al. (2010) report that participants with breadth vs. narrow category and high vs. low action identifications express that more positive attitude to the brand when they are in the promotion vs. prevention regulatory focus.

These findings suggest that the fit from construal can enhance the value of mental congruent information. This leads us to propose that consumer's comprehension of the product review depends critically on the fit between the construal levels of reviews and consumer's mental construal, which is induced through the consumer's psychological distance. We expect that consumers in proximal psychological distance will increase the positive evaluation of concrete reviews (i.e., low level construal). In contrary, when consumers are in remote psychological distance, they will increase the positive evaluation of abstract reviews and perceive such reviews as more valuable.

Hypothesis Development

The research model is depicted in Figure 1. Anchoring on the CLT, we propose that temporal and social distances could exert influences on a consumer's comprehension of product reviews, which differ in the levels of abstractness. A consumer's comprehension of product reviews is manifested by perceived review helpfulness (subjective assessment; information processing process) and recall capacity (objective assessment; information processing outcome). Review helpfulness is defined as a consumer's overall subjective assessment of the presented product reviews (Chen et al. 2008). It reflects the degree of diagnosticity of the reviews in assisting a consumer in making product evaluations (Kempf and Smith 1998; Mudambi and Schuff 2010; Zhao and Xie 2011). Recall capability is used to measure the degree of memory retention after an individual processes the given information. The choice of the two dependent

variables is built on the thesis that a consumer's information processing process and outcomes are typically considered in tandem (Meyers-Levy and Maheswaran 2004). The process is often measured by subjective variables, such as evaluations, judgments, attitudes or perceptions (Aaker and Lee 2001; Mackie 1987); while the outcomes are measured by objective variables, and the most popular one is recall (Meyers-Levy 1991; Unnava et al. 1996).

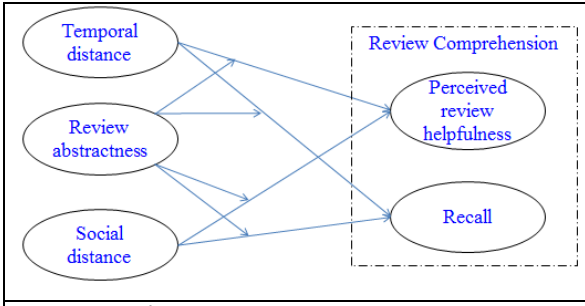

Figure 1. Research Model

Impacts on Perceived Review Helpfulness

The importance of understanding review helpfulness has recently attracted research attention. Bickart (2010), for example, investigates the type of reviews that are helpful to consumers in facilitating their decision making. The author observes that moderate review length and positive reviews and other factors, affect consumers' perceived review helpfulness. Mudambi et al. (2010) demonstrate that product type can moderate the perceived review helpfulness for consumers in their information processing. Moreover, Connors et al. (2011) show that self-proclaimed experts are more helpful than other reviewers, while the source of the review has little impact on consumers' perceptions.

Considering how a consumer, as a reader, would perceive a review to be helpful, we refer to the theoretical underpinning of the CLT. Accordingly, the influence could be understood from two dimensions of psychological distance (i.e., temporal distance and social distance).

Temporal distance: According to the CLT, a consumer tends to construe an object or event as high level construal when s/he is at a distant temporal distance; while when s/he is at a near temporal distance, the consumer would construe the same object as low level mental construal (Liberman and Trope 1998; Wyer et al. 2010). For instance, a consumer who plans to buy a notebook computer tomorrow might construe the object differently from another consumer who seeks to purchase a notebook computer six months later. The consumer who plans to buy this computer tomorrow would be more involved in examining the attributes of the product, compared with the other, which may influence their construing the product (Castano et al. 2008). With this different mental construal of a product by the consumers in different temporal distance, the reviews with different construal levels may impact consumers in different psychological distance (i.e., near versus distant temporal distance) on their comprehension of the reviews.

From the earlier analysis, we propose an interaction effect between the temporal distance and the review abstractness on consumers' perceived review helpfulness. When there is a match between the two, consumers would report higher review helpfulness. Specifically, we expect that the concrete reviews are perceived more helpful to consumers who are in near temporal distance. While for the concrete reviews, we deduce that such reviews would be perceived more helpful for temporally distant consumers. Thus, we propose the following hypothesis:

> *H1: When concrete reviews are presented, a consumer perceives the reviews to be more helpful when the temporal distance is near than when it is distant; however, when abstract reviews are presented, a consumer perceives the reviews to be less helpful when the temporal distance is near than when it is distant.*

Social distance: Social distance refers to a consumer's perceived feelings of others (Heider 1958; Tesser 1988); a socially near distance points to close feelings for like-minded and familiar others. Perceived social distance is one of the most important factors in influencing today's computer-mediated communication. The studies of Moon et al. (1998; 1999) show that, in online communication, information

from a person in a near location is perceived as more believable and of high information quality compared with information coming from a person with distant location. Forman and colleagues (2008) demonstrate that disclosure of reviewer information could alter a consumer's perception of the review s/he receives and thus impact the helpfulness rating of the review.

CLT posits that, as one dimension of psychological distance, social distance can also impact consumers' mental construal, which further influences their processing of the product reviews (Kim et al. 2008; Nan 2007; Stephan et al. 2010). A consumer often relies on low level processing in judgments of psychologically close others or their actions. However, for psychologically distant others, on the contrary, the consumer is more likely to construe the same action with high level processing, which leads to the high level mental construals (Liviatan et al. 2008; Trope and Liberman 2010). Therefore, the evaluation of a product expressed by socially close or distant others can be construed with different levels of mental construals. Specifically, when the reviews are posted by socially distant others, the information would be more likely to be construed at a higher and abstract level compared with reviews posted by socially close others (Liviatan 2008; Zhao and Xie 2011). Based on the theoretical analysis and the same argument with H1, we propose:

H2: When concrete reviews are presented, a consumer perceives the reviews to be more helpful when the social distance is near than when it is distant; however, when abstract reviews are presented, a consumer perceives the reviews to be less helpful when the social distance is near than when it is distant.

Impacts on Recall

Advertising and marketing researchers frequently use this variable to measure a consumer's learning outcome or degree of information comprehension of online information (e.g., consumer reviews). For instance, Keller et al. (1998) use a consumer's capacity to recall product information as the single measurement to verify the effects of advertisements. Hong (2004) uses recall as the key variable to measure the efficiency of an information format and a consumer's mental representation. Thus, understanding what factors influence a consumer's product impression and recall is crucial. In our context, product recall is reflected by the extent to which a consumer remembers the product attributes, and we propose that it can be impacted by both a consumer's psychological distance (i.e., near and distant) and the review abstractness (i.e., concrete and abstract reviews).

Recall performance is tightly related to the comprehension process (Chandra and Krovi 1999). A considerable number of previous studies have demonstrated that an elaborative process can result in better recall performance. Prior studies suggest that systematic information processing involved in a more elaborative process can lead to better information recall than a heuristic process (Chaiken 1980; Petty et al. 1983). Other numerous studies have argued that the fit between the presented information and the consumers' internal mental representation can trigger consumers to undergo an elaborative process to comprehend the presented information, and thus can lead to better recall (Bransford and Johnson 1973; Chandra and Krovi 1999; Dhar and Kim 2007). Drawing on the CLT, we argue that when the construal level of a consumer's mental construal of the product matches the construal level of the review, s/he will process the review information in a more elaborative way, which leads to better recall performance. Therefore, we propose the following hypotheses:

H3: With the provision of concrete reviews, a consumer can recall more of the focal product when the temporal distance is near than when it is distant; however with the provision of abstract reviews, a consumer recalls less when the temporal distance is near than when it is distant.

H4: With the provision of concrete reviews, a consumer can recall more of the focal product when the social distance is near than when it is distant; however with the provision of abstract reviews, a consumer recalls less when the social distance is near than when it is distant.

Study 1

Study 1 examines how temporal distance influences a consumer's review comprehension. A 2 (temporal distance: near versus distant) by 2 (product review: concrete versus abstract) between-subjects factorial design was used to investigate the interaction effects of temporal distance and product review type on the evaluation of consumer review helpfulness and recall.

A pretest was conducted to determine the products for this experiment. We recruited 20 students to attend the pretest. The students were from the same population as those who participated in the main experiment though those who participated in the pretest were not recruited for the actual experiment. At the start of the pretest, the students were given the following question: "If you have to work in a big company before you obtain your degree, which products do you think are the most essential and interesting for your job in the company?" The results showed that the cell-phone and notebook computer were considered as the most popular and essential products for this task. We chose two products as our experimental objects because this could diminish the bias caused by the consumers' attitudes to the products (e.g., preferences), while at the same time, this could also reduce statistical bias from using only one product.

Independent variables

Review type: We created 40 reviews for every product based on the reviews from two largest and most popular online shopping malls (i.e., www.amazon.com, www.taobao.com). We controlled the length of the reviews regardless of review abstractness and kept a similar word count for every review. Furthermore, a focus group interview was used to decide the number of reviews, for which we recruited 18 participants in the same sample pool as the main experiment (these participants did not participate in the main experiment). They were asked how many reviews they regularly read in their daily online shopping, and the results indicated that most of these members generally read about 20 reviews. Thus, we classified the 40 reviews into two groups, i.e., abstract (20) vs. concrete (20) treatment. In order to check whether these reviews were perceived as originally intended, we conducted a pretest. We asked 15 other participants who also did not attend the main experiment to classify each review according to the review abstractness. The results revealed that our classification is valid.

Temporal distance: We manipulated the temporal distance by recruiting different grades of undergraduate students to participate the experiment. We set a scenario which is temporal near for senior while temporal distant for freshmen. In the main experiment, the participants were asked to imagine the following scenario: In order to improve our students' practical ability, impart your knowledge to society and improve your ability to find a good job, the president and other leaders of our university have decided to add a new course to the original curriculum; every student has to attend this course in November (which was very near future from the time we conducted our experiment) when they are seniors. This course requires every student to take a job attachment in a large company, and in order to facilitate students' work and maintain their efficiency, all the students will be supported by university funding to buy a cell-phone and a notebook before joining the company. In this scenario, the senior students were considered as temporal near distance participants because they would take this course next week, while freshmen were considered as temporal remote distance participants.

Dependent Variables

In this study, consumers' comprehension of reviews is manifested by two dependent variables (i.e., perceived review helpfulness and recall). Perceived review helpfulness is measured on a 7-point Likert scale by the following items adopted from Sussman (2003) and Connors (2011): 1) The review improves my ability to make a decision whether or not to buy this product; 2) The review gives me insight into whether or not I would like this product; 3) The review contains useful information about this product. The participants were asked these questions after the experiment to understand their perception of the reviews. Recall was coded by three helpers who were not aware of the purpose of this study. Initially, we employed two helpers to fulfill the whole task. However, as one of them not unwell after she finished almost half of the work, we recruited another helper to go on doing her work with the same coding rules. Before conducting this session, all the video files of recall performance had been typed into word

document by other coders. The task processes of coding this session were as follows. First, the coders were told what they should do in the whole coding process. They were required to mark the pre-coded document and identify how many characteristics the participants recalled. Next, we trained the coders who were unfamiliar with the research hypotheses to code protocols using the data of ten samples. After that, the coders step into the main coding task. The inter-coder reliability was measured by Cohen's Kappa; the results met the substantial agreement (Kappa: 0.641). The level of agreement for the study protocols was highly significant ($z=25.794$, $p < 0.001$). Disagreements between coders were reconciled among the two coders and the authors.

Subjects and Experimental Procedure

One hundred and sixty subjects were recruited from the undergraduate student population of a large public university, in which freshmen and seniors accounted for 50 percent each of the participants. To encourage participation, the students were offered a cash reward which was higher than an hour of the standard wages of a student assistant. Among them, 98 (61.3%) were females and 62 (38.7%) were males. Their average age was 22 years.

The experiment was conducted in an electronic commerce laboratory equipped with more than 40 computers. At the beginning of the experiment, the subjects were told that all the instructions were provided online and that they should read them very carefully and complete the experiment. They had 10 to 20 minutes to ask any questions to facilitate their understanding of the assignments. After indicating their full understanding of the instructions, they were asked to log into the system and begin the experiment. Next, a scenario was provided by the system in which a new policy was being promulgated by the university that required every student to attend a course in order to obtain their degrees. The specific details were introduced in the "independent variable" session. After the scenario was given, the participants went on a shopping trip, in which two products were presented throughout the whole trip, but in a random sequence with different individuals possibly experiencing different sequences. All the participants would experience the introduction of these products and peer reviews, and were then asked to answer some questions about their perceptions relating to the whole shopping trip. At the end of the trip, the subjects completed a post-session questionnaire regarding their shopping experiences and the recall task which required them to recall the review contents and their own perceptions. All the experiment sessions were administered by two independent experimenters following a standard protocol. After completing the whole experiment, the subjects were told not to discuss any aspect of the study and their feelings on the study with their friends or classmates.

Results

Control and Manipulation Check

We performed control checks on gender and subjects' experience with the products and online shopping, and product sequence. A multivariate analysis of variance (MANOVA) test suggested that the random assignment of the subjects to four experimental conditions was successful. As there were more female than male subjects in the experiment, we compared the dependent variables for the two groups using T-tests. There were no significant differences between females and males in their perceived review helpfulness ($t = -0.652$, $p = 0.515$), recall of product attributes ($t = -0.649$, $p = 0.517$). Statistical tests were also performed to see if there were any systematic biases on the dependent variables due to subjects' experience with products and online shopping. There were no significant correlations between these control variables and the dependent variables.

Manipulation check was also conducted to ensure that our manipulation of the review abstractness was successful. The manipulation was verified by asking the participants to rate, on a 7-point Likert scale, like "most of the reviews I read describe the details of the products" and "most of the reviews I read describe the consumer experience towards the product". The results show that the participants perceive the concrete reviews are describing the details of the product (mean=5.42) significantly higher ($t=10.472$, $p=0.000$) than the abstract reviews (mean=3.50), confirming the successful manipulation of review abstractness.

Hypothesis Testing

Table 1 lists the descriptive statistics. Analyses of all dependent measures were conducted using SPSS for Windows Version 16.0 at the 5% level of significance. To control for the possible influence of the product knowledge, product experience, and sequence on dependent variables, these variables were included in Analysis of Covariance (ANCOVA) that was used to assess the effects of manipulated variables (i.e., review abstractness and temporal distance) on dependent variables.

Table 1. Descriptive Statistics

Temporal Distance / Measurement		Near		Distant	
		Concrete	Abstract	Concrete	Abstract
Review Helpfulness	Mean	5.483	4.621	4.938	4.683
	(S.D)	.830	.975	1.173	1.295
Recall	Mean	4.400	2.280	3.660	2.360
	(S.D)	1.860	1.102	1.387	1.701

H1 posits that a consumer perceives reviews as more helpful when the temporal distance is near than distant under the provision of concrete reviews; while under the provision of abstract reviews, a consumer perceives reviews as less helpful when the temporal distance is near than far. As predicted, the results suggest that perceived review helpfulness is significantly higher in temporally near (mean=5.483) than temporally distant (mean=4.938) under the provision of concrete reviews; while under the provision of abstract reviews, consumers perceive reviews as less helpful when the temporal distance is near (mean=4.621) than distant (mean=4.683), and the interaction effect is significant (F=7.401, p=0.012).

With respect to a consumer's capacity to recall product information, H3 posits that, with the provision of concrete reviews, a consumer can recall more of the focal product when the temporal distance is near than when it is distant; however with the provision of abstract reviews, a consumer recalls less when the temporal distance is near than when it is distant. The analytical results suggest that there is a significantly higher recall performance for temporally near consumers (mean=4.400) than for temporally distant consumers (mean=3.660) under the provision of concrete reviews; while under the provision of abstract reviews, consumers recall less when the temporal distance is near (mean=2.280) rather than distant (mean=2.360), and the interaction effect is significant (F=13.612, p=0.017).

To investigate the nature of the interaction effect, simple effect analyses (Morgan 2005) were conducted. In line with the formulation of hypotheses comparing differences on the effects of review abstractness under different temporal distances, subsequent data analysis was conducted by splitting the data set into two categories. For concrete review provision, the T-test showed that the consumers in near temporal distances perceive reviews as more helpful (t=7.210, p=0.008) and having better recall (t=10.878, p=0.001). However, under abstract review provision, consumers in remote temporal distances perceive review as more helpful (t=5.548, p=0.02) than in near temporal distances, while there were no significant differences in terms of recall performance (t=2.140, p=0.145).

Generally, the results suggest that Hypothesis 1 is fully supported, while Hypothesis 3 is only partially supported.

Discussion

The results of Study 1 show that temporal distance can influence a consumer's comprehension of consumer reviews. A consumer tends to perceive concrete reviews as more helpful in near temporal distance. When a consumer seeks to buy something in the near future, s/he needs to make a final decision in a short time; hence concrete reviews which are rich in detailed information can help him/her to learn more about the product. Observations on the impacts of concrete reviews on recall present similar effects. This is consistent with the previous findings which posit that helpful or diagnostic information is more accessible than others, and thus can elicit better recall performance from consumers (Stapel et al. 1998; Unnava et al. 1996).

However, when a consumer reads abstract reviews, s/he perceives abstract reviews to be more helpful when s/he is at a distant temporally distance rather than when at a near temporally distance. Despite this expected observation, we did not manage to observe a significant difference in the consumers' recall capacity. This could be due to the poor accessibility of abstract information which make it too difficult for consumers to recall more information and, consequently led to the non-significant differences between the two conditions.

Study 2

Study 1 tested the effect of temporal distance on influencing a consumer's comprehension of consumer reviews. We reckon that social distance can also impact a consumer's comprehension of reviews. Considering the possible interaction effect between the social distance and the temporal distance which has been studied by Kim and colleagues (2008), in this study, we only focus on the temporal near distance circumstance because, from our observation and daily experience, we find that most of the consumers are in near temporal distance, that is, most of them plan to buy something in the near future. Thus, in Study 2, we further investigate how social distance influences consumers' comprehension under the near temporal distance circumstance. This experiment is a 2 (social distance: near versus far) by 2 (product review: concrete versus abstract) between-subjects factorial design.

Variables

Similar to Study 1, we categorized reviews as concrete versus abstract review manipulation. This categorization was considered as valid because we conducted this study using the same participants. The location of the reviewers served to manipulate social distance. In the close social distance condition, the readers can read the reviews which are posted by the reviewers who share the same location with the reader. However, in the remote social distance condition, the participants could read all the reviews posted by the reviewers from distant areas.

Regarding the dependent variables, we also used the same method to collect data, including some questionnaire items to measure consumers' perceived review helpfulness and to obtain recall data using coding method.

Subjects and Experimental Procedure

A total of 200 university students participated. They were assigned randomly to one of the four conditions. In order to avoid the learning effect, we did not permit any of the students who had attended the previous experiment. There were 50 subjects in each treatment group. Among them, 128 (64%) were females and 72 (36%) were males. Their average age was 22 years. In order to ensure experimental realism, the subjects were given monetary incentives consisting of RMB30.00 individually.

All the procedures are the same as Study 1 except the scenario. They were given the following scenario: They would be assigned to a big company next week and had to buy a new cell phone and notebook computer for that work now. Furthermore, they were told that they were all representatives of their university. We set this scenario in order to encourage their involvement in the experiment.

Results and Discussion

Similar to Study 1, the results showed that the participants perceived the concrete reviews describing the details of the product (mean=3.83) as being significantly higher ($t=8.03$, $p<.001$) than the abstract reviews (mean=.50), confirming the successful manipulation of review abstractness. Social distance of consumers in reading reviews was verified by asking the participants to rate, on a 7-point Likert scale, "I think that the reviewer is close to me to some extent", "I think consumers from a same province enjoy a same taste with me to some extent" and "I think I belong to a same group with the reviewer to some extent". The results showed that the readers perceive the reviewer in the same province (mean=4.863) are much closer than from other province (mean= 3.172), confirming the successful manipulation of social distance ($t=9.688$, $p<0.001$).

Hypothesis Testing

Table 2 lists the descriptive statistics. We used the same statistical analysis method as in Study 1.

Table 2. Descriptive Statistics

Measurement \ Social Distance		Near		Distant	
		Concrete	Abstract	Concrete	Abstract
Review Helpfulness	Mean	5.287	5.023	5.337	4.523
	(S.D)	.849	.996	884	1.088
Recall	Mean	4.760	2.430	4.820	1.880
	(S.D)	1.615	1.130	1.533	.977

H2 posits that when the concrete reviews are presented, a consumer perceives the reviews to be more helpful when the social distance is near than when it is distant; while when the abstract reviews are presented, a consumer perceives the reviews to be less helpful when the social distance is near than when it is distant. The results suggest that a consumer perceives reviews as less helpful in socially near distance (mean=5.287) than in distant distance (mean=5.337) under the provision of concrete reviews; while under the provision of abstract reviews, a consumer perceives reviews as being more helpful when the social distance is near (mean=5.023) rather than distant (mean=4.523), and the interaction effect is significant (F=7.562, p=0.003).

H4 posits that with the provision of concrete reviews, a consumer can recall more of the focal product when the social distance is near than when it is distant; however with the provision of abstract reviews, a consumer recalls less when the social distance is near than when it is distant. The analytical results suggest that a consumer recalls less amount of information when the social distance is near (mean=4.760) than distant (mean=4.820) with the provision of concrete reviews; while with the provision of abstract reviews, a consumer recalls more when the social distance is near (mean=2.430) rather than when it is distant (mean=1.880), and the interaction effect is significant (F=9.302, p=0.023).

Generally, both Hypotheses 2 and 4 are not supported. The most probable reason is that the effect of social distance on a consumer's comprehension is moderated by the temporal distance. Although we tried to understand how a consumer comprehends the reviews in different social distance conditions, the near temporal distance may significantly impact the social distance effect on consumers' comprehension. In our study, we explore the effect of social distance under the condition of near temporal distance. A recent study of Zhao and Xie (2011) find that close others are more influential than the distant others only when the temporal distance is near; while when the temporal distance is remote, the distant others will be more influential than the close others (i.e., near social distance). Accordingly, our result, which reveals that consumers perceive the abstract review more helpful under the close social distance than the remote social distance, is consistent with Zhao' finding. However, we also find that when the concrete reviews are provided, consumers consider that there is no significant difference between the near and distant social distance. According to this surprising finding, we call for future studies to explore whether, even though under the near temporal distance, close social distance is always more influential than the remote social distance, or depends on the review abstractness.

General Discussion

Overall, it is observed that both temporal distance and social distance significantly influence a consumer's comprehension of the reviews. From the results, we can identify two main differences: 1) consumers in near and distant temporal distances have different comprehensions (perceived review helpfulness and recall) under the provision of either concrete or abstract reviews; and 2) consumers in near temporal distance perceive reviews as being more helpful and have better recall under the provision of concrete reviews; while, interestingly, we obtained partial contrasting results in another psychological distance dimension (i.e., social distance). That is, consumers in a near social distance perceive reviews as being more helpful and have better recall under the provision of abstract reviews.

Theoretical Implications

In recent years, there has been increasing interest in research on review helpfulness. It is generally agreed by both Information Systems (IS) and Marketing researchers that provide helpful reviews to consumers significantly influence a consumer's attitude toward products and even online purchase behavior (Chen et al. 2008; Connors et al. 2011). This present work contributes to the research literature in several areas.

First, by extending the prior research on the review helpfulness stream, our study, from a new perspective, examines how temporal distance and social distance influence a consumer's comprehension of reviews. Previous studies which examined helpfulness of consumer reviews (Cao et al. 2011; Ghose and Ipeirotis 2010; Jin and Liu 2010) typically adopted statistical or text mining perspectives. This study, through two consecutive experiments, demonstrates that a reader's temporal and social distances also affect his/her perceptions of the reviews (i.e., perceived helpfulness). To this end, this is the first study in IS research that applies the CLT in the focal context.

Second, the findings of this study address a conflicting problem in the previous studies relating to the influence of social distance. Some of the previous studies have investigated that social distance may impact readers' helpfulness ratings (Bickart 2010; Forman et al. 2008), while others did not (Connors et al. 2011). From our study, we deduce that review type (i.e., concrete and abstract reviews) may influence a consumer's review helpfulness ratings. Specifically, our study extends the prior findings and demonstrates that the review helpfulness rating is influenced by both review content and review context (e.g., the source of the review). More specifically, when the reviews are concrete, reviewer information disclosure may not affect a consumer's review helpfulness rating; however, when the reviews are abstract, then a consumer would perceive the reviews from geographically near reviewers as being more helpful.

Third, this is the first study investigating whether the review type (i.e., concrete review versus abstract review) can moderate a consumer's comprehension of reviews under different temporal and social distance. Extending the previous research, the classification of the review type as concrete and abstract reviews brings many new insights to the literature. For example, Zhao et al. (2011) find that under the temporal near distance, recommendations from socially near distance have greater impacts than remote distance. However, the findings of our study reveal that a consumer perceives reviews from socially near distance more helpful only when the reviews are abstract. Moreover, we did not find any significant difference in the helpfulness rating between consumers who are socially near and those who are socially distant in the presence of concrete reviews. Further research could consider validating whether review type can moderate the effect of social distance on a consumer's comprehension under the condition of temporal near distance.

Fourth, in contrast to previous studies which focus on examining review helpfulness only from subjective measures, this study further tests its objective measures (i.e., in terms of recall performance). This is important because reviews not only play the role of persuading a consumer to buy something immediately, but they have another role which is similar to that of advertisements. A consumer who plans to buy something in either near or distant future may learn about or understand the product quality from reading product reviews. Thus, reviews that impress a consumer and enhance good memory retention play an important role in influencing a consumer's future buying behavior.

Practical Implications

A key pivotal contribution of this study for practitioners is the addressing of an enduring problem relating to the type of reviews that are helpful to a consumer (Ghose 2007). For example, Amazon.com tries to find helpful reviews with an IT artifact in the form of an evaluative button marked with "Yes/No" options for answering the question: "Was this review helpful to you?" Although this method can identify helpful reviews, there is still a dependency on consumer evaluations. Accordingly, it is impossible for Amazon itself to make a judgment or prediction on what reviews are helpful to consumers (Jin 2010). Based on the findings of this study, mangers can identify and predict the helpful reviews on the basis of intrinsic review characteristics (i.e., abstractness of reviews) and consumers' psychological status.

Nevertheless, two challenges remain. The first one is how a judgment can be made about whether a review is concrete or abstract. The second relates to how a consumer's psychological distance to a review is discerned. To address the first challenge, text mining technology provides the answer. The mining method

could follow some rules, such as whether there is concrete attribute information emerging in the review; or if there are some emotional words in the review, and so on. This could be supported by Ghose (2010) and Pang (2004). To meet the second challenge, practitioners can rank reviews based on their sources, possibly by using social networks to change consumers' perceptions of reviews. For instance, on www.buy.com, consumers can share product information with their friends on a Facebook platform, which may change the information receiver's psychological status. Thus, imagine two product reviews, one from your friends, and the other from a stranger. Which one would you prefer to believe? Furthermore, if the review is abstract or concrete, what would be the difference in your perception? On the basis of this analysis, we strongly suggest that the current website operators try to understand the consumers' psychological bent and predict the possible influences caused by current communication technology (e.g., Facebook as the way to influence consumers' psychological distance).

In addition, based on the understanding of what type of reviews are perceived as helpful to consumers who are in different psychological distances, the designers could consider how to design a personalized review system. For example, by accumulating a consumers' profile or past shopping behavior, the system may judge whether a buyer can be greatly influenced by the socially closer people. Or by analyzing the browsing and searching behavior (Hong et al. 2004), the system also can try to judge a consumer's motivation, namely if s/he will buy the product in near or distant future. The results of this study can guide the practitioners to build an efficient personalized review system.

Last, but not least, the findings also help the practitioners to identify what reviews are truly helpful to consumers in different psychological status. Thus, they can try to update the current systems which focus on ranking the reviews by the consumer-rated helpful reviews. Meanwhile, this can also help the practitioners to automatically identify the helpful reviews posted recently (Pan 2011).

Limitations and Suggestions for Future Studies

As with all research, this study has some limitations. First, the two studies used a controlled experimental design with student samples, which may limit the external validity of this research. However, after further replication of this study which was conducted with a small university teacher sample (10 teachers), we obtained similar results as with the student samples. Although it is not an extensive non-student sample and not as generalizable as our replicated experiment, it did support our study with student samples. Moreover, it is also consistent with previous studies which noted that student subjects provide an appropriate sample when the focus is on controlled theory testing (Calder et al. 1981). Despite the reasonableness of conducting this study with a student sample, it still lacks greater generalizability. Thus, future research is needed to determine how consumers of different ages, culture and backgrounds comprehend consumer reviews.

Second, regarding review abstractness, our study investigates the differences between the presentations of concrete and abstract reviews, which may limit our research findings. Although there are significant differences between concrete and abstract reviews in affecting consumers' perceptions to the reviews, we do not know how a combination of concrete and abstract reviews affects consumers' perceptions. This occurs in the online environment where reviewers give their opinions with a mixture of abstract and concrete reviews (Ghose and Ipeirotis 2006). For example, "Yes, the notebook uses very smoothly, I like it very much because the CPU is the newest style with i5 processor…." Researchers could take the combination of concrete and abstract reviews into account in future studies. Furthermore, another important issue is the proportion of concrete and abstract pats in a review. What is the best ratio of abstract and concrete reviews which could lead to the best consumers' perceptions? Further studies are also needed to explore this interesting topic.

Third, as there is likely to be an interaction effect between the social distance and temporal distance, in our study, in order to obtain relatively pure influence caused by social distance, we control the temporal distance. We only focus on the temporal near distance when investigating the social distance effect. Although the results, to some extent, are in line with Zhao's study (2011), we suspect that the review type may moderate such an effect. Therefore, in future studies, we may consider investigating how social distance influence consumers comprehension to concrete and abstract reviews under the temporal remote distance. This could greatly contribute to the current literature relating to the interaction effect between temporal and social distance.

Fourth, different products may moderate our findings. On the basis of prior studies which demonstrated that search product and experience product could influence the review helpfulness to consumers, e.g., (Mudambi and Schuff 2010). In future studies, we could examine whether reviews for describing different product can influence consumers' comprehensions to the reviews when the consumers are in different psychological distance.

Conclusion

This study examines how temporal distance and social distance influence a consumer's comprehension to concrete and abstract reviews. Utilizing the CLT as the theoretical framework, our analysis suggests that consumers' perceived review helpfulness tightly related the consumers' psychological distance and the review abstractness. Consumers perceive reviews more helpful when there is a match between the psychological distance and the review abstractness. Besides contributing to literature in review helpfulness investigation, the results of this study offer useful implications to system designers. In the age when things change rapidly, it is imperative that research on review systems, such as this study, continue to generate findings that inform practice.

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